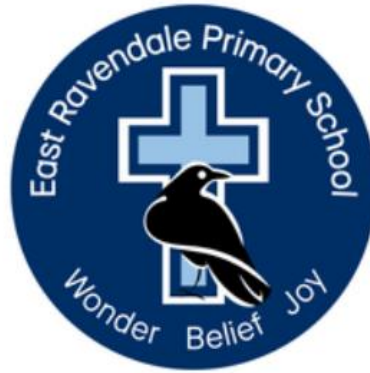




YEAR 3 AND 4 SCIENCE CURRICULUM CYCLE B

EAST RAVENDALE C OF E PRIMARY SCHOOL

At East Ravendale, we strive to develop independent, self-motivated and inquisitive learners of all ages. We celebrate our uniqueness and value all as God's children. We aim to give all members of our community opportunities to succeed, now and in the future, knowing they are safe and valued.

Our vision is underpinned by our core values of wonder, belief and joy.

"I can do all things through God who strengthens me." Philippians 4:13



Science at East Ravendale

At East Ravendale, our science curriculum reflects our vision to develop independent, self-motivated and inquisitive learners who feel valued, safe and inspired to succeed now and in the future. Rooted in our Christian ethos, we celebrate each child as unique and valued as God's creation. Guided by the belief that ***"I can do all things through God who strengthens me"*** (***Philippians 4:13***), we nurture confidence, curiosity and resilience. Through science, we bring our values of **wonder, belief and joy** to life while developing a strong understanding of the scientific world.

Wonder

We inspire a sense of wonder about the world God has created through engaging, hands-on experiences. Children are encouraged to question, explore and investigate through practical learning and outdoor opportunities. By building on prior knowledge across biology, chemistry and physics, pupils develop curiosity and become increasingly independent, inquisitive learners.

Belief

We foster belief by developing children's confidence in their ability to think scientifically and overcome challenges. Through carefully sequenced learning and working scientifically skills, pupils learn to trust in their abilities. By exploring science-related careers, children are encouraged to believe in their potential and aspire for the future.

Joy

We promote joy through exciting and engaging science experiences, including practical lessons, STEM events and cross-curricular learning. These opportunities create enthusiasm and help children retain knowledge. As a result, pupils develop a lasting love of science and a desire to continue exploring the world around them.



Year 3/4 Science Curriculum Cycle B

	<u>Autumn</u> <u>1</u>	<u>Autumn</u> <u>2</u>	<u>Spring</u> <u>1</u>	<u>Spring</u> <u>2</u>	<u>Summer</u> <u>1</u>	<u>Summer</u> <u>2</u>
Programme of Study	Sound	Animals including Humans	Forces and Magnets		Rocks	States of Matter
Area of Science	Physics	Biology	Physics		Chemistry	Chemistry



Why this, why now?

<u>Year 3/4</u> <u>Cycle B</u>	<u>Why this, why now?</u>
Autumn 1 – Sound	In this unit pupils will be able to apply their knowledge of music and sound in a scientific way. They will learn how sound is made, travels and its sources. This will enable them to further study human physiology further on in their education.
Autumn 2 – Animals including Humans	In this unit pupils will build on knowledge learned in KS1. They will build on their knowledge of healthy foods and keeping healthy and begin to look at what is needed for bodies to be healthy, preparing for further learning in UKS2.
Spring 1/2 – Forces and Magnets	This unit builds on knowledge from EYFS and prepares the pupils for further learning in UKS2. They will begin to work more scientifically as they compare and observe magnetic forces.
Summer 1 – Rocks	In this unit pupils will explore different types of rock and their properties. This unit links in with the pupils' learning in geography which includes erosion, and the effects this has on our planet.
Summer 2 – States of Matter	Building on from learning in EYFS and KS1, pupils will now focus on the classification of different materials.

Scientists

At East Ravensdale, children learn about a diverse range of scientists alongside their National Curriculum science studies. By exploring **historical** and **contemporary** scientists from a variety of backgrounds, including **underrepresented** groups, pupils develop science capital, see the relevance of science in everyday life, and recognise that science is for everyone.

“I can do all things through God who strengthens me.” Philippians 4:13



Autumn 1 - Sound

Prior Knowledge	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)
Objectives to be taught	<u>Y4 Objectives</u> • Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear • Find patterns between the pitch of a sound and features of the object that produce it • Find patterns between the volume of a sound and the strength of the vibrations that produced it • Recognise that sounds get fainter as the distance from the sound increases
Core Knowledge	▪ To know what a high and low sound is ▪ To know what a loud and quiet sound is ▪ To know that sound sources vibrate to make sounds ▪ To know that vibrations change when the volume of the sound changes ▪ To know how sound travels ▪ To know what materials, absorb sound ▪ To know how an object can make different pitches of sounds ▪ To know that distance affects the volume of a sound



Working Scientifically Statements	○ Ask relevant questions and using different types of scientific enquiries to answer them ○ Making systematic and careful observations and where appropriate taking accurate measurements using standard units, using a range of equipment (data loggers) ○ Setting up simple practical enquiries, comparative and fair tests ○ Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ○ Recording findings using simple scientific language, drawings, labelled diagrams, bar charts and tables ○ Reporting on findings from enquiries including oral and written explanations, displays or presentations of results and conclusion ○ Use scientific language correctly and with some confidence
Vocabulary	ear, eardrum, vibration, particles, pitch, volume, amplitude, soundwave, quiet, loud, high, low, travel, distance, soundproof, absorb sound
TAPS Assessment	Investigating Pitch – click here
Scientists	Aristotle - Philosopher who developed the concept that sound travels through air due to the movement of air particles Isaac Newton - Mathematician & Physicist who measured the speed of sound



Suggested Resources

CLEAPSS

Elastic band guitar

Sound bottles

How does distance affect the volume of sound?

Can sound make rice jump?

Sound vibrations in water

Using a tuning fork to feel sound vibrations

Investigating loud and quiet sounds

Detecting vibrations from sounds



Autumn 2 – Animals including Humans

Prior Knowledge	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals, including humans) Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals, including humans) Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 - Animals, including humans) Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). (Y2 - Animals, including humans) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans)
Objectives to be taught	<u>Y3 Objectives</u> • Identify that animals including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • Identify that humans and some animals have skeletons and muscles for support, protection and movement.
Core Knowledge	▪ To know what animals and humans need to stay healthy ▪ To know the names of different food groups and the types of food which are part of these ▪ To know the nutrients human need for a healthy diet ▪ To know how to gather information from food labels ▪ To know the names of different types of skeletons ▪ To know the advantages and disadvantages of different skeletons ▪ To know the main parts of the human skeleton ▪ To know how muscles work and be able to explain how they work



Working Scientifically Statements	○ Asking relevant questions and using different types of scientific enquiries to answer them ○ Using straightforward scientific evidence to answer questions or to support their findings ○ Making systematic and careful observations and where appropriate taking accurate measurements using standard units, using a range of equipment, including thermometers & data loggers (if appropriate) ○ Setting up simple practical enquiries; comparative and fair tests ○ Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ○ Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables ○ Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ○ Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ○ Use scientific vocabulary correctly and with some confidence
Vocabulary	food groups, fibre, fruit, vegetables, meat, fish, cereals, sugars, fats (saturated and unsaturated), vitamins, minerals, skeleton, bone, muscles, tendon, joints, biceps, triceps, contract, relax, move, cartilage, vertebrate, invertebrate, endoskeleton, exoskeleton, hydrostatic skeleton, skull, spine, ribs, pelvis, vertebral column, clavicle, scapula, humerus, ulna, radius, femur, tibia, fibula, elbow, wrist, metatarsals, phalanges
TAPS Assessment	Skeleton Research – click here Skeleton Explanation – click here
Scientists	Wilhelm Roentgen – physicist who discovered x-rays Marie Curie – physicist who invented the first mobile x-ray machine to treat soldiers wounded on the battlefield in WWI Adelle Davis – biochemist & nutritionist who linked health and diet Michelle Williams - radiologist



Suggested Resources

CLEAPSS

[Model of a hand](#)

“I can do all things through God who strengthens me.” Philippians 4:13



Spring 1 & Spring 2 – Forces and Magnets

Prior Knowledge	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)
Objectives to be taught	<u>Y3 Objectives</u> • Compare how things move on different surfaces • Notice that some forces need contact between two objects, but magnetic forces can act at a distance • Observe how magnets attract or repel each other and attract some materials and not others • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials • Describe magnets as having two poles • Predict whether two magnets will attract or repel each other, depending on which poles are facing
Core Knowledge	▪ To know the names of different styles of magnets ▪ To know that magnets have two poles (north and south) ▪ To know which poles, repel and which attract ▪ To know that forces are either a push or a pull ▪ To know that friction on an object slows it down ▪ To know which materials are magnetic ▪ To know that different magnets are different strengths



Working Scientifically Statements	○ Asking relevant questions and using different types of scientific enquiries to answer them ○ Using straightforward scientific evidence to answer questions or to support their findings ○ Making systematic and careful observations and where appropriate taking accurate measurements using standard units, using a range of equipment, including thermometers & data loggers (if appropriate) ○ Setting up simple practical enquiries; comparative and fair tests ○ Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ○ Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables ○ Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ○ Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ○ Use scientific vocabulary correctly and with some confidence
Vocabulary	friction, move, movement, surface, distance, strength, push, pull, contact, non-contact, magnetic, magnetic field, magnetic force, bar magnet, horseshoe magnet, ring magnet, poles, north pole. South pole, attract, repel, metal, iron, copper, aluminium, steel, brass
TAPS Assessment	Car Ramps – click here Magnet Test – click here
Scientists	William Gilbert - Doctor who developed the theory of magnetism Leonardo Da Vinci - First person to plan and carry out tests on friction Eric Laithwaite - Electrical Engineer who developed the technology behind the Maglev train



Suggested Resources

CLEAPSS

[Magnetic maze](#)

[Investigating the strength of a magnet](#)

[Make a magnetically suspended rocket](#)

[Is it magnetic?](#)

[Iron for breakfast](#)



Summer 1 - Rocks

Prior Knowledge	Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)
Objectives to be taught	<u>Y3 Objectives</u> • Compare and group together different kinds of rocks based on their appearance and simple physical properties • Describe in simple terms how fossils are formed when things that have lived are trapped within rock • Recognise that soils are made from rocks and organic matter
Core Knowledge	▪ To know the name of different types of rocks ▪ To know examples of human-made and natural rocks ▪ To know properties of different types of rocks ▪ To know the names and be able to explain the different types of rocks (sedimentary, igneous, metamorphic) ▪ To know how fossils are formed ▪ To know who Mary Anning is and her importance ▪ To know how soil is formed



Working Scientifically Statements	○ Asking relevant questions and using different types of scientific enquiries to answer them ○ Using straightforward scientific evidence to answer questions or to support their findings ○ Making systematic and careful observations and where appropriate taking accurate measurements using standard units, using a range of equipment, including thermometers & data loggers (if appropriate) ○ Setting up simple practical enquiries comparative and fair tests ○ Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ○ Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables ○ Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ○ Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ○ Use scientific vocabulary correctly and with some confidence
Vocabulary	rock, slate, granite, sandstone, chalk, soil, clay, sand, limestone, quartz, marble, stone, pebble, texture, absorbent, characteristic, surface, sedimentary rock, igneous rock, metamorphic rock, permeable, semi-permeable, impermeable, durable, natural, human-made, magma, lava, molten rock, sediment, erosion, fossil, layers, fossilisation, sandy, chalky, peaty, loamy, topsoil, mineral, organic matter, compost
TAPS Assessment	Rocks Report – click here



Scientists	William Smith - Engineer & Geologist who developed the science of rock strata James Hutton - Scientist who studied rocks and the effects of natural processes on them, such as rain, running water, tides, and volcanoes, on the development of the Earth Florence Bascom - Geologist who studied the origin and formation of mountains Anjana Khatwa - Geologist who collects rocks and fossils from the beach and studies them to learn about the creatures that lived in the sea and on Earth over 150 million years ago Brianna Green - Biogeochemist who collects soil to see what kind of living things are in it to study the effects of climate change
Suggested Resources	CLEAPSS Testing rocks for hardness Making cast fossils using plaster of Paris Making trace fossils Dinosaur dig Studying soil



Summer 2 – States of Matter

Prior Knowledge	Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials) Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials) Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)
Objectives to be taught	<u>Y4 Objectives</u> • Compare and group materials together, according to whether they are solids, liquids or gases • Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature



Core Knowledge	▪ To know the properties of solids, liquids and gases. ▪ To know that freezing and melting are opposite processes that change the state of a material. ▪ To know the melting and freezing point of different materials ▪ To know that heating causes evaporation ▪ To know that cooling causes condensation ▪ To know that evaporation and condensation are opposite processes that change the state of a material ▪ To know the higher the temperature the quicker water evaporates ▪ To be able to explain the different stages of the water cycle
Working Scientifically Statements	○ Asking relevant questions and using different types of scientific enquiries to answer them ○ Using straightforward scientific evidence to answer questions or to support their findings ○ Making systematic and careful observations and where appropriate taking accurate measurements using standard units, using a range of equipment, including thermometers & data loggers (if appropriate) ○ Setting up simple practical enquiries comparative and fair tests ○ Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ○ Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables ○ Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ○ Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ○ Use scientific vocabulary correctly and with some confidence



Vocabulary	solid, liquid, gas, particles, evaporate, condense, melt, freeze, heat, cool, melting point, freezing point, boiling point, water vapour, precipitation, collection, underground water, sea, river, stream, water droplets, hail, atmosphere
TAPS Assessment	Dunking Biscuits – click here
Scientists	Joseph Priestley - Clergyman who discovered oxygen at about the same time as Carl Wilhelm Scheele Carl Wilhelm Scheele - Chemist who discovered oxygen at about the same time as Joseph Priestley Daniel Fahrenheit - Physicist who invented the Fahrenheit temperature scale and the thermometer Anders Celsius - Astronomer who invented the degrees Celsius temperature scale John Boyd Dunlop - Inventor of the pneumatic tyre
Suggested Resources	CLEAPSS Making ice cream without a freezer Observing melting Dissolving jelly Investigating heating and melting

